

NMCP COVID-19 Literature Report #41: Friday, 25 September 2020

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Purpose: These now weekly reports, published on Fridays, are curated collections of current research, evidence reviews, and news regarding the COVID-19 pandemic. Please feel free to reach out with questions, suggestions for future topics, or any other concerns.

All reports are available online at <https://nmcp.libguides.com/covidreport>. Access is private; you will need to use the direct link or bookmark the URL, along with the case-sensitive password "NMCPfinest".

Disclaimer: I am not a medical professional. This document is current as of the date noted above. While I make every effort to find and summarize available data, things are changing rapidly, with new research and potentially conflicting literature published daily.

Statistics

Global today: 32,308,999 confirmed cases and 984,278 deaths in 188 countries/regions

7 days ago: 30,217,420 confirmed cases and 946,847 deaths in 188 countries/regions

14 days ago: 28,212,036 confirmed cases and 910,314 deaths in 188 countries/regions

United States*

top 5 states by cases (Virginia is ranked 15th)

	TOTAL US	CA	TX	FL	NY	GA
Confirmed Cases	6,987,129	800,436	747,413	695,887	453,755	311,698
Tests	98,481,026	13,952,857	5,860,833	5,179,499	10,228,645	2,824,816
Deaths	203,015	15,411	15,518	13,915	33,095	6,816

*see census.gov for current US Population data; NA: not all data available

[JHU CSSE](https://jhu.csse.psu.edu) as of 1200 EDT 25 September 2020

Virginia	Total	Chesapeake	Hampton	Newport News	Norfolk	Portsmouth	Suffolk	Virginia Beach
Cases	144,433	4,271	1,803	2,715	4,800	2,547	1,963	6,776
Hospitalized	10,806	402	65	96	361	274	123	369
Deaths	3,136	71	24	38	78	58	72	88

[VA DOH](https://doe.virginia.gov) as of 1200 EDT 25 September 2020

Evidence Summary: Preoperative Screening for COVID-19

Question: "What is the current standard of care for pre-operative screening for COVID? Are there studies supporting or arguing against pre-operative screening or with criteria for screening?"

A good deal of literature on this topic comes from the otolaryngology field – not surprising, given the respiratory nature of the SARS-CoV-2 virus and presumed modes of transmission. In some cases these concerns altered other preoperative screening tests, such as swabbing for *Staphylococcus aureus* nasal or oropharyngeal colonization ([JTCVS](#)). Providers at the University of Pittsburgh who do procedures for head and neck reconstruction state that preoperative testing for SARS-CoV-2 is an "essential component of the preoperative evaluation" ([Head Neck \[Ranasinghe\]](#)).

Other concerns, including the varying sensitivity of PCR and/or serologic testing, result in treating cases as presumed COVID-19 positive to reduce exposure risk. Vinh and colleagues note: "[E]ven for patients tested negative for COVID19, many institutions suggest that the highest level of PPE available should be worn that protects against potential transmission of aerosolized SARS-CoV-2 for procedures of the upper aerodigestive tract" ([Head Neck \[Vinh\]](#)). They also point out that reevaluation may be necessary as community transmission rates change, new testing methodologies are developed, and evidence emerges from the literature ([Head Neck \[Vinh\]](#)).

There is some evidence that a positive test for SARS-CoV-2 infection in asymptomatic patients may be a rare event, but may offer other benefits such as reduced use of PPE and less anxiety in healthcare workers ([Gastroenterology \[Dolinger\]](#); [Gastroenterology \[Podboy\]](#); [J Clin Microbiol](#)).

Consensus and Recommendations

An international group of providers conducted a Delphi exercise of operating room processes. There were high levels of consensus for statements on preoperative screening: 90% agreed with "all patients should be considered to be COVID contagious unless proven otherwise during the pandemic" and 95% agreed with "where safe and possible, surgical patients should be tested before operation for COVID-19" ([Br J Surg](#)). Most (73%) agreed that "screening questions are a poor way to identify potential patients with COVID" but a statement on "the patient's viral load can help predict postoperative outcomes and aid decisions on management" had only 27% agreeing, 65% unsure, and 8% disagreeing ([Br J Surg](#)).

A Japan-based survey of practices led to recommending "that during the COVID-19 pandemic, in order to prevent medical disruption due to hospital-acquired infections of SARS-CoV-2, the screening system, including RT-PCR testing, is firstly mandatory for all patients requiring inpatient cares, not just surgical treatments" ([Auris Nasus Larynx](#)).

While many professional organizations and societies may have COVID-19 guidelines, they may not necessarily address preoperative testing along with symptom screening. For example, a joint statement from multiple gastroenterology groups recommends symptom screening, but does not mention COVID-19 testing prior to procedures ([Joint GI societies](#)). In looking at endoscopic cases, Forde and colleagues state:

"[R]egardless of the result of PCR testing, we would argue that endoscopy staff should proceed with equal caution in patients with negative tests. Additionally, our experience suggests that routine testing of asymptomatic patients may be low yield, despite theoretically decreasing staff exposure to COVID-19 carriers. As such, we recommend that all practices adhere to social distancing, hygiene, and use full-barrier PPE during every procedure to minimize transmission and maximize safety, regardless of test results. Ultimately, specific testing practices should be tailored to disease prevalence rates in distinct communities." ([Gastroenterology](#))

The American Academy of Otolaryngology — Head and Neck Surgery is more explicit in their recommendations:

"Unless emergent, surgical procedures should only be undertaken after ascertaining the COVID-19 status and then performed using either N95 respirator masks with either goggles or a face shield or PAPR [powered air purifying respirator]." ([AAO-HNS](#))

Other Evidence and Experiences

A retrospective analysis of 31 consecutive patients undergoing elective and emergency digestive surgery in France early in the outbreak found only 1 patient positive for SARS-CoV-2, leading to surgery postponement; the other 30 patients had surgery with no occurrence of COVID-19 or COVID-19 related problems ([Surgery](#)).

Surgeons at the University of Alabama (UAB) instituted a "level" system for surgical procedures and developed a preoperative testing strategy, along with a decolonization process ([Am J Surg](#)). They write:

"At UAB, through a central source of order entry, we developed a robust pre-procedural testing model that has enabled excellent clinical care, minimized PPE use while at the same time increasing provider safety and confidence. This testing model allowed for an earlier expansion of surgery capabilities and provision of needed surgical care for Tier 2a, 3a, and 3b patients. No periprocedural team member has contracted COVID-19 from a patient interaction since the implementation of our testing efforts." ([Am J Surg](#))

There is a strong case to test all surgical patients, regardless of symptoms ([Ann Surg](#); [Can J Anaeth](#)). There are also calls to test all patients, not just those undergoing surgical procedures, to be tested for COVID-19 ([Crit Care Explor](#)).

Decision Aids

Forrester and colleagues developed a decision tree algorithm based on institutional guidelines and current data on hospital and non-hospital transmission of COVID-19. They note:

"The underlying assumption was that every patient is potentially infected with COVID-19 until proven otherwise. This assumption is based on growing community spread of COVID-19, which placed the burden for ruling out infection on the healthcare team... This algorithm prioritizes patients based on disease severity, testing status, and symptomatology while ensuring rational use of PPE in a resource-constrained setting." ([JACS](#)).

Of particular interest to this question is Figure 1:

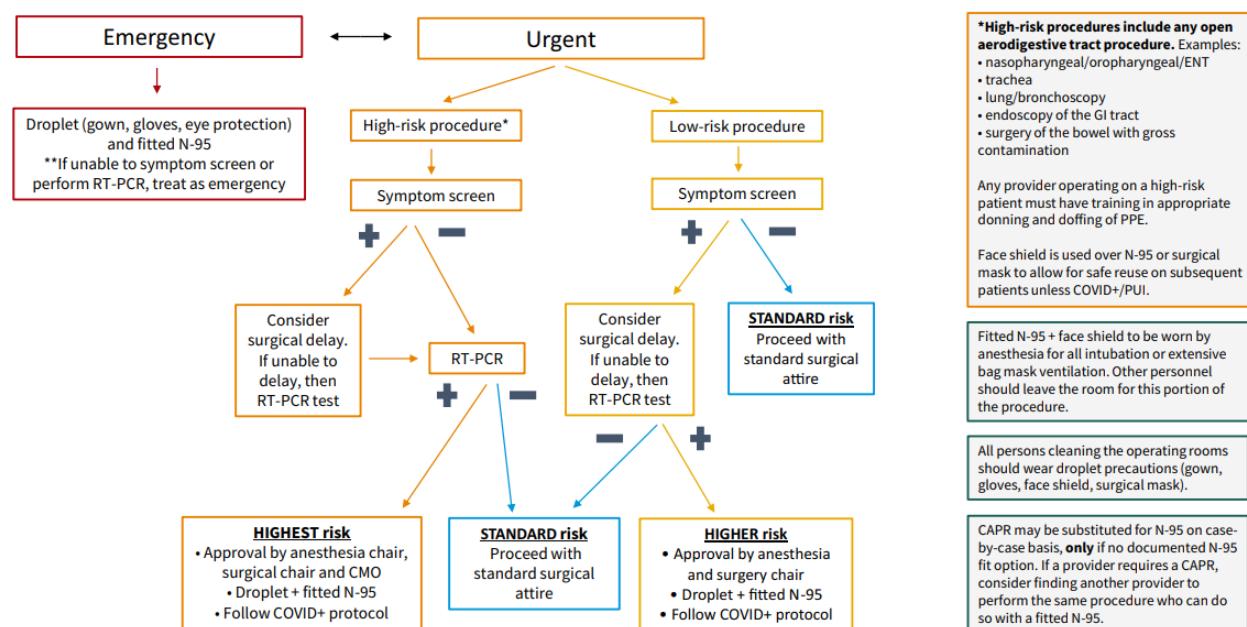


Figure 1. Algorithm describing institutional precautions for operating room team members (surgeons, nurses, technicians). CAPR, controlled air purifying respirator; CMO, chief medical officer; COVID, novel coronavirus 2019; GI, gastrointestinal; PPE, personal protective equipment; PUI, patient under investigation; RT-PCR, reverse transcription polymerase chain reaction.

For a screening protocol specific to ENT, see the article from Urban and colleagues ([Otolaryngol Head Neck Surg](#)).

This summary is limited in scope. See also this collection of citations, including those cited above, for a more comprehensive view of the literature on this topic:

<https://www.ncbi.nlm.nih.gov/sites/myncbi/tracy.shields.1/collections/60011633/public/>

Other COVID-19 Reports

Numerous organizations produce curated reports on the latest COVID-19 literature, many with different goals, coverage, or focus. Most have a subscribe feature – in case you want more than is provided in the NMCP COVID-19 literature reports.

Alliance for Pandemic Preparedness (University of Washington): [COVID-19 Literature Situation Report](#)

"COVID-19 Literature Situation Report is a daily (M-F) newsletter that provides a succinct summary of the latest scientific literature related to the COVID-19 pandemic.

The scientific literature on COVID-19 is rapidly evolving and these articles were selected for review based on their relevance to Washington State decision making around COVID-19 response efforts. Included in these Lit Reps are some manuscripts that have been made available online as pre-prints but have not yet undergone peer review. Please be aware of this when reviewing articles included in the Lit Reps."

CDC Library: [COVID-19 Science Updates](#)

"To help inform CDC's COVID-19 Response, as well as to help CDC staff stay up to date on the latest COVID-19 research, the Response's Office of the Chief Medical Officer has collaborated with the CDC Office of Library Science to create a series called I. This series, the first of its kind for a CDC emergency response, provides brief summaries of new COVID-19-related studies on many topics, including epidemiology, clinical treatment and management, laboratory science, and modeling. These summaries are released every Tuesday and Friday."

See also the CDC's weekly podcast: "The [MMWR Weekly COVID-19 Briefing](#) is a weekly podcast to update readers on the latest scientific information from CDC's COVID-19 response. In each episode, MMWR Editor-in-Chief Dr. Charlotte Kent provides an overview of the latest scientific information published in MMWR. New episodes are posted every Monday."

[COVID-19 Literature Surveillance Team](#)

"We are a non-profit composed of medical students, PhDs, physicians and other passionate individuals. We keep up with the latest research on COVID-19/SARS-CoV-2, find the newest articles, read them, grade their level of evidence, and bring you the bottom line. Our goal is to empower you to take the best care of yourself and those in your care."

Indiana Clinical and Translational Sciences Institute (CTSI): [COVID-19 Daily Digest](#)

"The COVID-19 Daily Digest is made possible by WISE Indiana (Wellbeing Informed by Science and Evidence in Indiana) – a partnership between the Indiana Clinical and Translational Sciences Institute's Monon Collaborative and the Indiana Family and Social

Services Administration to engage Indiana's nationally-recognized academic experts to evaluate and inform Indiana practices, programs and policies."

Johns Hopkins Center for Health Security: [COVID-19 Situation Reports](#)

Public Health England (PHE): [COVID-19 Rapid Reviews](#) and [COVID-19 Literature Digest](#)

"The primary role of the COVID-19 Evidence team is to support the use of evidence within PHE's COVID-19 response. This is achieved by identification of rapid reviews on relevant topics (both published and ongoing), production of evidence summaries and rapid reviews, and by identification of evidence gaps.

The COVID-19 Evidence team consists of a number of core members including a cell lead, reviewers, an information scientist and administration support, plus a flexible pool of reviewers and topic experts."

"The PHE COVID-19 Literature Digest team produces an evidence digest three times per week, which contains evidence from journal articles, both published and in press/preprints. Please note that preprints are preliminary reports of work that have NOT been peer-reviewed. They should not be relied on to guide clinical practice or health-related behaviour and should NOT be reported in news media as established information. The evidence is organised into 8 themes (serology and immunology, diagnostics, genomics, epidemiology and clinical, infection control, treatment, and modelling). If you want to be added to the email distribution list, please send a request to COVID.LitDigest@phe.gov.uk and you will receive the latest literature digest (now produced Monday, Wednesday and Friday) straight to your inbox."

Special Reports

GAO: [COVID-19: Federal Efforts Could Be Strengthened by Timely and Concerted Actions](#)
(published 21 September 2020)

"This report updates our oversight of federal actions to support public health, individuals, and the economy during the COVID-19 pandemic. Findings include:

- There have been shortages of personal protective equipment and testing supplies because very few of them are made in the U.S. and global demand for them is high
- HHS may be able to collect more complete data on COVID-19 cases, hospitalizations, and deaths among racial and ethnic minority groups
- The Department of the Treasury and the IRS don't know how many eligible people have yet to receive an economic impact payment

We made 16 recommendations to address these and other issues."

Selected Literature: Peer-Reviewed Journals

Date given is the date published or posted online; often these papers are ahead of print.

25 September 2020

JAMA Pediatr: [Susceptibility to SARS-CoV-2 Infection Among Children and Adolescents Compared With Adults: A Systematic Review and Meta-analysis](#)

"What is the evidence on the susceptibility to and transmission of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) among children and adolescents compared with adults?

In this systematic review and meta-analysis including 32 studies, children and adolescents younger than 20 years had 44% lower odds of secondary infection with SARS-CoV-2 compared with adults 20 years and older; this finding was most marked in those younger than 10 to 14 years. Data were insufficient to conclude whether transmission of SARS-CoV-2 by children is lower than by adults.

Preliminary evidence suggests that children have a lower susceptibility to SARS-CoV-2 infection compared with adults, but the role that children and adolescents play in transmission of this virus remains unclear."

24 September 2020

Science: [Auto-antibodies against type I IFNs in patients with life-threatening COVID-19](#)

"Interindividual clinical variability in the course of SARS-CoV-2 infection is immense. We report that at least 101 of 987 patients with life-threatening COVID-19 pneumonia had neutralizing IgG auto-Abs against IFN- ω (13 patients), the 13 types of IFN- α (36), or both (52), at the onset of critical disease; a few also had auto-Abs against the other three type I IFNs. The auto-Abs neutralize the ability of the corresponding type I IFNs to block SARS-CoV-2 infection in vitro. These auto-Abs were not found in 663 individuals with asymptomatic or mild SARS-CoV-2 infection and were present in only 4 of 1,227 healthy individuals. Patients with auto-Abs were aged 25 to 87 years and 95 were men. A B cell auto-immune phenocopy of inborn errors of type I IFN immunity underlies life-threatening COVID-19 pneumonia in at least 2.6% of women and 12.5% of men."

Science: [Inborn errors of type I IFN immunity in patients with life-threatening COVID-19](#)

"Clinical outcome upon infection with SARS-CoV-2 ranges from silent infection to lethal COVID-19. We have found an enrichment in rare variants predicted to be loss-of-function (LOF) at the 13 human loci known to govern TLR3- and IRF7-dependent type I interferon

(IFN) immunity to influenza virus, in 659 patients with life-threatening COVID-19 pneumonia, relative to 534 subjects with asymptomatic or benign infection. By testing these and other rare variants at these 13 loci, we experimentally define LOF variants in 23 patients (3.5%), aged 17 to 77 years, underlying autosomal recessive or dominant deficiencies. We show that human fibroblasts with mutations affecting this pathway are vulnerable to SARS-CoV-2. Inborn errors of TLR3- and IRF7-dependent type I IFN immunity can underlie life-threatening COVID-19 pneumonia in patients with no prior severe infection."

Sci Rep: [Efficacy of masks and face coverings in controlling outward aerosol particle emission from expiratory activities](#)

"The COVID-19 pandemic triggered a surge in demand for facemasks to protect against disease transmission. In response to shortages, many public health authorities have recommended homemade masks as acceptable alternatives to surgical masks and N95 respirators. Although mask wearing is intended, in part, to protect others from exhaled, virus-containing particles, few studies have examined particle emission by mask-wearers into the surrounding air. Here, we measured outward emissions of micron-scale aerosol particles by healthy humans performing various expiratory activities while wearing different types of medical-grade or homemade masks. Both surgical masks and unvented KN95 respirators, even without fit-testing, reduce the outward particle emission rates by 90% and 74% on average during speaking and coughing, respectively, compared to wearing no mask, corroborating their effectiveness at reducing outward emission. These masks similarly decreased the outward particle emission of a coughing superemitter, who for unclear reasons emitted up to two orders of magnitude more expiratory particles via coughing than average. In contrast, shedding of non-expiratory micron-scale particulates from friable cellulosic fibers in homemade cotton-fabric masks confounded explicit determination of their efficacy at reducing expiratory particle emission. Audio analysis of the speech and coughing intensity confirmed that people speak more loudly, but do not cough more loudly, when wearing a mask. Further work is needed to establish the efficacy of cloth masks at blocking expiratory particles for speech and coughing at varied intensity and to assess whether virus-contaminated fabrics can generate aerosolized fomites, but the results strongly corroborate the efficacy of medical-grade masks and highlight the importance of regular washing of homemade masks."

23 September 2020

JAMA: [Association of SARS-CoV-2 Test Status and Pregnancy Outcomes](#)

"SARS-CoV-2 test positivity in individuals in labor was associated with a higher prevalence of preeclampsia and lower prevalence of induction of labor. COVID-19 is primarily a respiratory infection but also has systemic effects that may resemble preeclampsia. The

absence of an increased prevalence of preterm birth is concordant with results of 2 previous studies using comparators. The lack of difference in Apgar scores and birth weight for gestational age between groups is similar to that in a US study.

In light of other accumulating data, it is already clear that COVID-19 is less severe in pregnancy than the 2 previous coronavirus infections: severe acute respiratory syndrome-related coronavirus (SARS) and Middle East respiratory syndrome-related coronavirus (MERS). Nevertheless, there are reports of pregnant persons requiring critical care, and there have been other reports of both mother and infant deaths in association with COVID-19.¹⁹

JAMA Netw Open: [Association of Red Blood Cell Distribution Width With Mortality Risk in Hospitalized Adults With SARS-CoV-2 Infection](#)

"In patients with SARS-CoV-2 infection, is there an association between mortality risk and red blood cell distribution width (RDW), a routine complete blood count component, at the time of admission and during hospitalization?

In this cohort study of 1641 adult patients with SARS-CoV-2 infection who were hospitalized, elevated RDW at admission and increasing RDW during hospitalization were associated with statistically significant increases in mortality risk. The association between the RDW at admission and mortality risk was independent of D-dimer (dimerized plasmin fragment D) level, absolute lymphocyte count, demographic factors, and common comorbidities.

The findings suggest that an elevated RDW measured at admission and increasing RDW during hospitalization were associated with significantly higher mortality risk for patients with SARS-CoV-2 infection; RDW may be helpful for patient risk stratification."²⁰

JAMA Netw Open: [Risk Factors for Hospitalization, Mechanical Ventilation, or Death Among 10 131 US Veterans With SARS-CoV-2 Infection](#)

"What are the risk factors associated with hospitalization, mechanical ventilation, and death among patients with severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infection?

In this national cohort study of 88 747 veterans tested for SARS-CoV-2, hospitalization, mechanical ventilation, and mortality were significantly higher in patients with positive SARS-CoV-2 test results than among those with negative test results. Significant risk factors for mortality included older age, high regional coronavirus disease 2019 burden, higher Charlson Comorbidity Index score, fever, dyspnea, and abnormal results in many routine laboratory tests; however, obesity, Black race, Hispanic ethnicity, chronic obstructive pulmonary disease, hypertension, and smoking were not associated with mortality.

In this study, most deaths from SARS-CoV-2 occurred in patients with age of 50 years or older, male sex, and greater comorbidity burden."

Lancet Infect Dis: [Performance characteristics of five immunoassays for SARS-CoV-2: a head-to-head benchmark comparison](#)

"Four commercial, widely available assays and a scalable 384-well ELISA can be used for SARS-CoV-2 serological testing to achieve sensitivity and specificity of at least 98%. The Siemens assay and Oxford immunoassay achieved these metrics without further optimisation.

This benchmark study in immunoassay assessment should enable refinements of testing strategies and the best use of serological testing resource to benefit individuals and population health."

MMWR: [Changing Age Distribution of the COVID-19 Pandemic — United States, May–August 2020](#)

"Early in the pandemic, COVID-19 incidence was highest among older adults.

During June–August 2020, COVID-19 incidence was highest in persons aged 20–29 years, who accounted for >20% of all confirmed cases. Younger adults likely contribute to community transmission of COVID-19. Across the southern United States in June 2020, increases in percentage of positive SARS-CoV-2 test results among adults aged 20–39 years preceded increases among those aged ≥60 years by 4–15 days.

Strict adherence to community mitigation strategies and personal preventive behaviors by younger adults is needed to help reduce infection and subsequent transmission to persons at higher risk for severe illness."

Nature: [Animal models for COVID-19](#)

"Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) is the etiological agent of coronavirus disease 2019 (COVID-19), an emerging respiratory infection caused by introduction of a novel coronavirus into humans in late 2019 in China's Hubei province. As of September 11, 2020, SARS-CoV-2 has spread to 215 countries, has infected more than 28 million people, and has caused more than 910,000 deaths. Since humans do not have pre-existing immunity against SARS-CoV-2, there is an urgent need to develop therapeutics and vaccines to mitigate the current pandemic and to prevent the re-emergence of COVID-19 in the future. In February 2020 the World Health Organization (WHO) assembled an international panel of experts to develop animal models for COVID-19 to accelerate testing of vaccines and therapeutics. This review summarizes the findings to date and provides relevant information for preclinical testing of COVID-19 vaccine candidates and therapeutics."

Sci Adv: [The unfolding COVID-19 pandemic: A probability-based, nationally representative study of mental health in the U.S.](#)

"The COVID-19 pandemic is a collective stressor unfolding over time, yet rigorous published empirical studies addressing mental health consequences of COVID-19 among large probability-based national samples are rare. Between 3/18-4/18/20, during an escalating period of illness and death in the United States, we assessed acute stress, depressive symptoms and direct, community, and media-based exposures to COVID-19 in three consecutive representative samples across three 10-day periods (total N=6,514) from the U.S. probability-based nationally representative NORC AmeriSpeak panel. Acute stress and depressive symptoms increased significantly over time as COVID-19 deaths increased across the U.S. Pre-existing mental and physical health diagnoses, daily hours of COVID-19-related media exposure, exposure to conflicting COVID-19 information in media, and secondary stressors were all associated with acute stress and depressive symptoms. Results have implications for targeting of public health interventions and risk communication efforts to promote community resilience as the pandemic waxes and wanes over time."

22 September 2020

JAMA collection: Viewpoint articles from the editors of JAMA Network journals, all published on the same day, with a statement from the [JAMA editors](#) summarizing what is covered:

[Cardiology and COVID-19](#): "In this Viewpoint, JAMA Cardiology editors review the journal's more important articles advancing the scientific understanding of COVID-19 and the heart in the first 6 months of the pandemic, including evidence of direct myocardial injury and indirect effects of the pandemic on outcomes for patients with CVD postponing care for fear of contracting the virus."

[Dermatology and COVID-19](#): "In this Viewpoint, JAMA Dermatology editors review the skin findings seen in association with coronavirus disease 2019 (COVID-19), how best to respond to those manifestations, and ways the pandemic has affected the practice of dermatology, including reassignment of specialists to COVID-19 care and the transition to teledermatology."

[Internal Medicine and COVID-19](#): "In this Viewpoint, JAMA Internal Medicine editors offer a broad review of the clinical science emerging from the first 6 months of the coronavirus disease 2019 (COVID-19) pandemic, including epidemiology of the infection, evidence that has influenced clinical care, and a discussion of workforce and supply chain issues and health inequities affecting patients and essential workers."

[Nephrology and COVID-19](#): "In this Viewpoint, JAMA's nephrology associate editor and colleagues review how COVID-19 has affected the practice of nephrology, including the rise in incidence of acute kidney injury (AKI) in patients with more severe disease, shortages of

supplies and staff to care for AKI patients, effects on kidney transplantation, and implementation of telehealth."

[Neurology and COVID-19](#): "In this Viewpoint, JAMA Neurology editors review the journal's more important articles advancing scientific understanding of COVID-19 in the first 6 months of the pandemic, including surveys of neurologic manifestations of the infection and identification of potential direct viral involvement in the central nervous system."

[Oncology and COVID-19](#): "This Viewpoint summarizes the clinical characteristics of patients with cancer as associated with increased mortality risk from COVID-19, and it highlights important areas where more research is needed."

[Ophthalmology and COVID-19](#): "In this Viewpoint, JAMA Ophthalmology's editor reviews the known eye manifestations of COVID-19, the potential for ocular transmission of illness, and the effects of the pandemic on ophthalmologic practice and research."

[Otolaryngology–Head and Neck Surgery and COVID-19](#): "In this Viewpoint, JAMA Otolaryngology–Head & Neck Surgery's editor in chief reviews how the COVID-19 pandemic has affected the practice of otolaryngology–head and neck surgery in its first 6 months, including through a shift away from procedural management of head and neck disease toward medical and noninvasive management to mitigate risk of infection transmission, and through the acute rise in incidence of patients with olfactory dysfunction requiring consultation and follow-up."

[Pediatrics and COVID-19](#): "In this Viewpoint, the editor of JAMA Pediatrics summarizes the effect on children of the first 6 months of the COVID-19 pandemic, reviewing evidence for why they seem not to become ill or as sick as adults and discussing the pandemic's likely long-term effects on child development and psychological health."

[Psychiatry and COVID-19](#): "In this Viewpoint, JAMA Network's psychiatry editors review how the coronavirus disease 2019 (COVID-19) pandemic has affected the practice of psychiatry in its first 6 months, for example, through disruptions of care provided in group settings, provision of telehealth, and widespread anxiety and health care worker burnout and depression."

[Surgery and COVID-19](#): "In this Viewpoint JAMA Surgery's editor reviews how the COVID-19 pandemic has affected the practice of general surgery in its first 6 months, including the need for universal precautions to mitigate the risks of infection transmission, the cessation and resumption of elective procedures, and adverse effects on educational experiences of students aspiring to the specialty."

[JAMA Health Forum and COVID-19](#): "In this Viewpoint, JAMA Health Forum's editor reviews important policy issues that characterized the first 6 months of the COVID-19 pandemic, including personal protective equipment (PPE) shortages, health inequities among

vulnerable populations, requests from patients for medical exemptions from face mask requirements, and the benefits and risks of school reopenings."

[JAMA Network Open and COVID-19](#): "In this Viewpoint, JAMA Network Open editors review the journal's more important articles advancing scientific understanding of COVID-19 in the first 6 months of the pandemic, and discuss the importance of a global open access journal to meeting the public health challenge."

MMWR: [COVID-19 Contact Tracing in Two Counties — North Carolina, June–July 2020](#)

"Successful SARS-CoV-2 contact tracing requires timeliness and community engagement to encourage participation and cooperation.

During periods of high COVID-19 incidence in North Carolina, 48% of COVID-19 patients reported no contacts, and 25% of contacts were not reached in Mecklenburg County. In Randolph County, 35% of COVID-19 patients reported no contacts, and 48% of contacts were not reached. Median interval from index patient specimen collection to contact notification was 6 days.

Despite aggressive efforts by health departments, many COVID-19 patients do not report contacts, and many contacts cannot be reached. Improved timeliness of contact tracing, community engagement, and community-wide mitigation are needed to reduce SARS-CoV-2 transmission."

PLoS Med: [Occurrence and transmission potential of asymptomatic and presymptomatic SARS-CoV-2 infections: A living systematic review and meta-analysis](#)

Author summary:

"We did a living systematic review through 10 June 2020, using automated workflows that speed up the review processes and allow the review to be updated when relevant new evidence becomes available.

Overall, in 79 studies in a range of different settings, 20% (95% confidence interval [CI] 17%–25%, prediction interval 3%–67%) of people with SARS-CoV-2 infection remained asymptomatic during follow-up, but biases in study designs limit the certainty of this estimate.

In seven studies of defined populations screened for SARS-CoV-2 and then followed, 31% (95% CI 26%–37%, prediction interval 24%–38%) remained asymptomatic.

We found some evidence that SARS-CoV-2 infection in contacts of people with asymptomatic infection is less likely than in contacts of people with symptomatic infection (relative risk 0.35, 95% CI 0.10–1.27).

The findings of this living systematic review suggest that most people who become infected with SARS-CoV-2 will not remain asymptomatic throughout the course of infection.

Future studies should be designed specifically to determine the true proportion of asymptomatic SARS-CoV-2 infections, using methods to minimise biases in the selection of study participants and ascertainment of symptom status during follow-up.

The contribution of presymptomatic and asymptomatic infections to overall SARS-CoV-2 transmission means that combination prevention measures, with enhanced hand hygiene, masks, testing tracing, and isolation strategies and social distancing, will continue to be needed."

PLoS Med: [Patterns of COVID-19 testing and mortality by race and ethnicity among United States veterans: A nationwide cohort study](#)

Author summary:

"We used electronic health records from the largest integrated healthcare system in the US to investigate racial and ethnic disparities in testing and subsequent COVID-19 mortality.

Non-Hispanic Black and Hispanic individuals were twice as likely as non-Hispanic White individuals to test positive for COVID-19, even after accounting for other demographics, geographic location, and underlying health conditions.

The racial disparity between Black and White individuals in testing positive for COVID-19 slightly decreased over the study period, and was highest in the Midwest compared to all other regions. The ethnic disparity between Hispanic and White individuals in testing positive for COVID-19 was consistent across time, geographic region, and outbreak pattern; the disparity was consistently observed across all strata.

Among those who tested positive for COVID-19, there was no observed difference in 30-day mortality by race/ethnicity group.

Our findings highlight the urgent need for improved strategies to contain and prevent further outbreaks in racial and ethnic minority communities."

Thorax: [Upper respiratory viral load in asymptomatic individuals and mildly symptomatic patients with SARS-CoV-2 infection](#)

"Asymptomatic individuals with SARS-CoV-2 infection have viable viral loads and have been linked to several transmission cases. However, data on the viral loads in such individuals are lacking. We assessed the viral loads in asymptomatic individuals with SARS-CoV-2 infection in comparison with those in symptomatic patients with COVID-19.

Study participants were recruited from a community facility designated for the isolation of patients with mild COVID-19 in South Korea. The presence of symptoms was evaluated with

a questionnaire-based survey. Viral loads in the upper respiratory tract were measured with real-time reverse transcription-PCR (RT-PCR) targeting the E, RdRp and N genes of SARS-CoV-2, with a cycle threshold (Ct) value of 40 for determining positivity.

In 213 patients with SARS-CoV-2 infection, 41 (19%) had remained asymptomatic from potential exposure to laboratory confirmation and admission; of them, 39 (95%) underwent follow-up RT-PCR testing after a median 13 days. In 172 symptomatic patients, 144 (84%) underwent follow-up RT-PCR testing. Twenty-one (54%) asymptomatic individuals and 92 (64%) symptomatic patients tested positive for SARS-CoV-2 at follow-up. Asymptomatic individuals and symptomatic patients did not show any significant differences in the mean Ct values of the E (31.15 vs 31.43; p>0.99), RdRp (32.26 vs 32.93; p=0.92) and N (33.05 vs 33.28; p>0.99) genes.

Approximately one-fifth of the individuals without severe symptoms were asymptomatic, and their viral loads were comparable to those in symptomatic patients. A large proportion of mildly symptomatic patients with COVID-19 or asymptomatic individuals with SARS-CoV-2 showed persistent positive upper respiratory RT-PCR results at follow-up."

21 September 2020

Emerg Infect Dis: [SARS-CoV-2 Seroprevalence among Healthcare, First Response, and Public Safety Personnel, Detroit Metropolitan Area, Michigan, USA, May–June 2020](#)

"To estimate seroprevalence of severe acute respiratory syndrome 2 (SARS-CoV-2) among healthcare, first response, and public safety personnel, antibody testing was conducted in emergency medical service agencies and 27 hospitals in the Detroit, Michigan, USA, metropolitan area during May–June 2020. Of 16,403 participants, 6.9% had SARS-CoV-2 antibodies. In adjusted analyses, seropositivity was associated with exposure to SARS-CoV-2-positive household members (adjusted odds ratio [aOR] 6.18, 95% CI 4.81–7.93) and working within 15 km of Detroit (aOR 5.60, 95% CI 3.98–7.89). Nurse assistants (aOR 1.88, 95% CI 1.24–2.83) and nurses (aOR 1.52, 95% CI 1.18–1.95) had higher likelihood of seropositivity than physicians. Working in a hospital emergency department increased the likelihood of seropositivity (aOR 1.16, 95% CI 1.002–1.35). Consistently using N95 respirators (aOR 0.83, 95% CI 0.72–0.95) and surgical facemasks (aOR 0.86, 95% CI 0.75–0.98) decreased the likelihood of seropositivity."

JAMA: [Ensuring Adequate Palliative and Hospice Care During COVID-19 Surges](#)

"An ethical approach to pandemic surge planning requires recognizing and addressing threats of scarcity throughout the community, including for patients whose primary goals are symptom relief and comfort at the end of life. Failure to plan for adequate palliative and hospice care when a substantial increase in disease and death is expected is

unconscionable, and it risks undermining patient-family trust, long-term emotional health, and the core values of society."

18 September 2020

Emerg Infect Dis: [In-flight transmission of severe acute respiratory syndrome coronavirus 2](#)

"Four persons with severe acute respiratory syndrome coronavirus 2 infection had traveled on the same flight from Boston, Massachusetts, USA, to Hong Kong, China. Their virus genetic sequences are identical, unique, and belong to a clade not previously identified in Hong Kong, which strongly suggests that the virus can be transmitted during air travel."

Emerg Infect Dis: [Transmission of severe acute respiratory syndrome coronavirus 2 during long flight](#)

"To assess the role of in-flight transmission of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), we investigated a cluster of cases among passengers on a 10-hour commercial flight. Affected persons were passengers, crew, and their close contacts. We traced 217 passengers and crew to their final destinations and interviewed, tested, and quarantined them. Among the 16 persons in whom SARS-CoV-2 infection was detected, 12 (75%) were passengers seated in business class along with the only symptomatic person (attack rate 62%). Seating proximity was strongly associated with increased infection risk (risk ratio 7.3, 95% CI 1.2–46.2). We found no strong evidence supporting alternative transmission scenarios. In-flight transmission that probably originated from 1 symptomatic passenger caused a large cluster of cases during a long flight. Guidelines for preventing SARS-CoV-2 infection among air passengers should consider individual passengers' risk for infection, the number of passengers traveling, and flight duration."

Nat Biotechnol: [Measurement of SARS-CoV-2 RNA in wastewater tracks community infection dynamics](#)

"We measured severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) RNA concentrations in primary sewage sludge in the New Haven, Connecticut, USA, metropolitan area during the Coronavirus Disease 2019 (COVID-19) outbreak in Spring 2020. SARS-CoV-2 RNA was detected throughout the more than 10-week study and, when adjusted for time lags, tracked the rise and fall of cases seen in SARS-CoV-2 clinical test results and local COVID-19 hospital admissions. Relative to these indicators, SARS-CoV-2 RNA concentrations in sludge were 0–2 d ahead of SARS-CoV-2 positive test results by date of specimen collection, 0–2 d ahead of the percentage of positive tests by date of specimen collection, 1–4 d ahead of local hospital admissions and 6–8 d ahead of SARS-CoV-2 positive test results by reporting date. Our data show the utility of viral RNA monitoring in municipal wastewater for SARS-CoV-2 infection surveillance at a population-wide level. In communities facing a delay between specimen collection and the reporting of test results,

immediate wastewater results can provide considerable advance notice of infection dynamics."

--> *ICYMI, see also this recent article, which was based in the Hampton Roads region:*

Water Res: [COVID-19 surveillance in Southeastern Virginia using wastewater-based epidemiology](#) (available online 13 August 2020)

"Wastewater-based epidemiology (WBE) has been used to analyze markers in wastewater treatment plant (WWTP) influent to characterize emerging chemicals, drug use patterns, or disease spread within communities. This approach can be particularly helpful in understanding outbreaks of disease like the novel Coronavirus disease-19 (COVID-19) when combined with clinical datasets. In this study, three RT-ddPCR assays (N1, N2, N3) were used to detect severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) RNA in weekly samples from nine WWTPs in southeastern Virginia. In the first several weeks of sampling, SARS-CoV-2 detections were sporadic. Frequency of detections and overall concentrations of RNA within samples increased from mid March into late July. During the twenty-one week study, SARS-CoV-2 concentrations ranged from 101 to 104 copies 100 mL⁻¹ in samples where viral RNA was detected. Fluctuations in population normalized loading rates in several of the WWTP service areas agreed with known outbreaks during the study. Here we propose several ways that data can be presented spatially and temporally to be of greatest use to public health officials. As the COVID-19 pandemic wanes, it is likely that communities will see increased incidence of small, localized outbreaks. In these instances, WBE could be used as a pre-screening tool to better target clinical testing needs in communities with limited resources."

Sci Adv: [Antibody-like proteins that capture and neutralize SARS-CoV-2](#)

"To combat SARS-CoV-2 and any unknown emerging pathogens in the future, the development of a rapid and effective method to generate high-affinity antibodies or antibody-like proteins is of critical importance. We here report a high-speed in vitro selection of multiple high-affinity antibody-like proteins against various targets including the SARS-CoV-2 spike protein. The sequences of monobodies against the SARS-CoV-2 spike protein were successfully procured within only four days. Furthermore, the obtained monobody efficiently captured SARS-CoV-2 particles from the nasal swab samples of patients and exhibited a high neutralizing activity against SARS-CoV-2 infection (IC₅₀ = 0.5 nM). The high-speed in vitro selection of antibody-like proteins would be useful for the rapid development of a detection method and a neutralizing protein against a virus responsible for an ongoing, and possibly a future, pandemic."

17 September 2020

Ann Intern Med: [Transmission of SARS-CoV-2: A Review of Viral, Host, and Environmental Factors](#)

"Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), the etiologic agent of coronavirus disease 2019 (COVID-19), has spread globally in a few short months. Substantial evidence now supports preliminary conclusions about transmission that can inform rational, evidence-based policies and reduce misinformation on this critical topic. This article presents a comprehensive review of the evidence on transmission of this virus. Although several experimental studies have cultured live virus from aerosols and surfaces hours after inoculation, the real-world studies that detect viral RNA in the environment report very low levels, and few have isolated viable virus. Strong evidence from case and cluster reports indicates that respiratory transmission is dominant, with proximity and ventilation being key determinants of transmission risk. In the few cases where direct contact or fomite transmission is presumed, respiratory transmission has not been completely excluded. Infectiousness peaks around a day before symptom onset and declines within a week of symptom onset, and no late linked transmissions (after a patient has had symptoms for about a week) have been documented. The virus has heterogeneous transmission dynamics: Most persons do not transmit virus, whereas some cause many secondary cases in transmission clusters called "superspreading events." Evidence-based policies and practices should incorporate the accumulating knowledge about transmission of SARS-CoV-2 to help educate the public and slow the spread of this virus."

Nat Commun: [A systematic review of antibody mediated immunity to coronaviruses: kinetics, correlates of protection, and association with severity](#)

"Many public health responses and modeled scenarios for COVID-19 outbreaks caused by SARS-CoV-2 assume that infection results in an immune response that protects individuals from future infections or illness for some amount of time. The presence or absence of protective immunity due to infection or vaccination (when available) will affect future transmission and illness severity. Here, we review the scientific literature on antibody immunity to coronaviruses, including SARS-CoV-2 as well as the related SARS-CoV, MERS-CoV and endemic human coronaviruses (HCoVs). We reviewed 2,452 abstracts and identified 491 manuscripts relevant to 5 areas of focus: 1) antibody kinetics, 2) correlates of protection, 3) immunopathogenesis, 4) antigenic diversity and cross-reactivity, and 5) population seroprevalence. While further studies of SARS-CoV-2 are necessary to determine immune responses, evidence from other coronaviruses can provide clues and guide future research."

ICYMI

Clin Infect Dis: [Healthcare professionals' perceptions of critical care resource availability and factors associated with mental well-being during COVID-19: Results from a US survey](#) (published 02 September 2020)

Assessing the impact of COVID-19 on intensive care unit (ICU) providers' perceptions of resource availability and evaluating factors associated with emotional distress/burnout can inform interventions to promote provider well-being.

Between April 23-May 7, 2020, we electronically administered a survey to physicians, nurses, respiratory therapist (RTs) and advanced practice providers (APPs) caring for COVID-19 patients in the US. We conducted multivariate regression to assess associations between concerns, reported lack of resources and three outcomes: emotional distress/burnout (primary outcome), and two secondary outcomes: 1) fear that hospital is unable to keep providers safe, and 2) concern about transmitting COVID-19 to family/community.

We included 1,651 respondents from all 50 states; 47% nurses, 25% physicians, 17% RTs, 11% APPS. Shortages of intensivists and ICU nurses were reported by 12% and 28% of providers, respectively. The largest supply restrictions reported were for powered air purifying respirators (PAPRs); (56% reporting restricted availability). Provider concerns included worries about transmitting COVID-19 to family/community (66%), emotional distress/burnout (58%), and insufficient personal protective equipment (PPE) (40%). After adjustment, emotional distress/burnout was significantly associated with insufficient PPE access (aRR: 1.43, 95% CI: 1.32 - 1.55), stigma from community (aRR: 1.32, 95% CI: 1.24 - 1.41), and poor communication with supervisors (aRR: 1.13, 95% CI: 1.06 - 1.21). Insufficient PPE access was the strongest predictor of feeling that the hospital is unable to keep providers safe and worries about transmitting infection to families/communities.

Addressing insufficient PPE access, poor communication from supervisors, and community stigma may improve provider mental well-being during the COVID-19 pandemic."

Selected Literature: Preprints

Preprints are found on preprint servers such as [arXiv](#), [bioRxiv](#), and [medRxiv](#); they are commonly used for biomedical research. Preprints may later be published in peer-reviewed journals.

Per medRxiv: "Preprints are preliminary reports of work that have not been certified by peer review. They should not be relied on to guide clinical practice or health-related behavior and should not be reported in news media as established information."

medRxiv: [Dynamic Change of COVID-19 Seroprevalence among Asymptomatic Population in Tokyo during the Second Wave](#) (posted 23 September 2020)

"Fatality rates related to COVID-19 in Japan have been low compared to Western Countries and have decreased despite the absence of lockdown. Serological tests monitored across the course of the second wave can provide insights into the population-level prevalence and dynamic patterns of COVID-19 infection.

We conducted an observational cohort study. Healthy volunteers working for a Japanese company in Tokyo were enrolled from disparate locations to determine seropositivity against COVID19 from May 26 to August 25, 2020. COVID-19 IgM and IgG antibodies were determined by a rapid COVID19 IgM/IgG test kit using fingertip blood. Across the company, tests were performed and acquired weekly. For each participant, serology tests were offered twice, separated by approximately a month, to provide self-reference of test results and to assess for seroconversion and seroreversion.

Workplace setting within a large company. Participants: Healthy volunteers from 1877 employees of a large Japanese company were recruited to the study from 11 disparate locations across Tokyo. Participants having fever, cough, or shortness of breath at the time of testing were excluded.

Seropositivity rate (SPR) was calculated by pooled data from each two-weeks window across the cohort. Either IgM or IgG positivity was defined as seropositive. Changes in immunological status against SARS-CoV-2 were determined by comparing results between two tests obtained from the same individual.

Six hundred fifteen healthy volunteers (mean + SD 40.8 + 10.0; range 19-69; 45.7 % female) received at least one test. Seroprevalence increased from 5.8 % to 46.8 % over the course of the summer. The most dramatic increase in SPR occurred in late June and early July, paralleling the rise in daily confirmed cases within Tokyo, which peaked on August 4. Out of the 350 individuals (mean + SD 42.5 + 10.0; range 19-69; 46.0 % female) who completed both offered tests, 21.4 % of those individuals who tested seronegative became seropositive and seroreversion was found in 12.2 % of initially seropositive participants. 81.1% of IgM positive cases at first testing became IgM negative in approximately one month.

COVID-19 infection may have spread widely across the general population of Tokyo despite the very low fatality rate. Given the temporal correlation between the rise in seropositivity and the decrease in reported COVID-19 cases that occurred without a shut-down, herd immunity may be implicated. Sequential testing for serological response against COVID-19 is useful for understanding the dynamics of COVID-19 infection at the population-level."

medRxiv: [Molecular Architecture of Early Dissemination and Massive Second Wave of the SARS-CoV-2 Virus in a Major Metropolitan Area](#) (posted 23 September 2020)

"We sequenced the genomes of 5,085 SARS-CoV-2 strains causing two COVID-19 disease waves in metropolitan Houston, Texas, an ethnically diverse region with seven million residents. The genomes were from viruses recovered in the earliest recognized phase of the pandemic in Houston, and an ongoing massive second wave of infections. The virus was originally introduced into Houston many times independently. Virtually all strains in the second wave have a Gly614 amino acid replacement in the spike protein, a polymorphism that has been linked to increased transmission and infectivity. Patients infected with the Gly614 variant strains had significantly higher virus loads in the nasopharynx on initial diagnosis. We found little evidence of a significant relationship between virus genotypes and altered virulence, stressing the linkage between disease severity, underlying medical conditions, and host genetics. Some regions of the spike protein - the primary target of global vaccine efforts - are replete with amino acid replacements, perhaps indicating the action of selection. We exploited the genomic data to generate defined single amino acid replacements in the receptor binding domain of spike protein that, importantly, produced decreased recognition by the neutralizing monoclonal antibody CR30022. Our study is the first analysis of the molecular architecture of SARS-CoV-2 in two infection waves in a major metropolitan region. The findings will help us to understand the origin, composition, and trajectory of future infection waves, and the potential effect of the host immune response and therapeutic maneuvers on SARS-CoV-2 evolution."

News in Brief

"200,000 people in the US have now died of the coronavirus. The figure, which public health experts believe is still grossly undercounted, marks half a year since US officials started scrambling to contain the pandemic" ([BuzzFeed](#)).

Our numbness to the coronavirus death count may be rooted in a lack of empathy ([Atlantic](#)).

Official figures for the pandemic probably don't tell the whole picture ([Economist](#)).

Long read: "The road ahead: Charting the coronavirus pandemic over the next 12 months — and beyond" ([STAT](#))

Transmission and Exposure

The airborne risk of COVID-19 is being disputed and hospitals are in the crossfire ([KHN](#)).

Not helping matters is the confusion over changes to guidelines that were posted on the CDC's website – then removed hours later – that referenced airborne spread ([AP](#)). The agency claimed it was a website error ([WaPo](#)). See this [archived version from 18 September 2020](#) and [21 September 2020 version](#) for comparison.

"Nearly 11,000 people have been exposed to the coronavirus on flights, the CDC says" ([WaPo](#)).

"A city in Brazil where covid-19 ran amok may be a 'sentinel' for the rest of the world" ([MIT Tech Rev](#)).

Virginia's governor and his wife have tested positive for coronavirus; he doesn't have symptoms and she has mild symptoms ([NPR](#)).

Vaccines

A UK-based vaccine study will include challenge trials – volunteers will be intentionally infected with SARS-CoV-2 to test vaccine effectiveness ([BBC](#)).

The coronavirus vaccine being developed by Johnson & Johnson is starting phase 3 trials; the vaccine may have advantages over others since it doesn't have to be kept frozen and may only need one shot instead of two ([NYT](#)).

The FDA is expected to announce higher standards for COVID-19 vaccine approvals ([WaPo](#)).

A group of Black doctors has created a panel to look at any vaccines approved ([STAT](#)).

Risk Factors and Ripple Effects

"COVID-19 data on Native Americans is 'a national disgrace.' This scientist is fighting to be counted" ([Science](#)).

The cardiac effects of coronavirus – a virus that spreads in the air and infects the mainly respiratory system – adds to its mystique ([Atlantic](#)).

We don't know how many COVID long-haulers are out there, but this may offer some idea of the scale of the problem ([Bloomberg](#)).

State of the Literature

Remember that hydroxychloroquine study in *The Lancet* that led to a high profile retraction? (If not, or if you want a refresher, see NMCP reports [#19](#) and [#20](#) where it was covered in greater detail.) The journal's editors posted a statement on the changes and other efforts to mitigate it happening again ([Lancet](#)).

"50 experts to trust in a pandemic" ([Elemental](#))

Thanks, Coronavirus

All that staying at home has had yet another drawback – more garbage ([NPR](#)).

Apparently the increase in homebodies is to blame for a run on freezers and refrigerators with freezers, causing yet another kind of shortage ([NPR](#)).

Only the Very Best Puppers (But Really, They Are ALL the Best) Need Apply

In case you find yourself traveling, maybe try ending up in Helsinki Airport – dogs there are trained to detect coronavirus and help with screening passengers arriving from abroad ([Helsinki Airport](#)).

These canine super sniffers are not just cute fuzzy faces either; they are close to 100% accurate and can identify the virus in seconds ([Guardian](#)).



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